

52

SPLIT

DART AEROSPACE LTD	Work Order:	19666A
Description: Fwd Crosstube	Part Number:	D2889
Drawing: D2889 Rev. B; D6005 Rev. A	Qty:	19 10
		Page 1 of 2

Step	Location	Procedure	By	Date	Qty
1	DC	Issue Traveller <i>Dwg. not required RF 02.11.05</i>	<i>KA</i>	03.09.19	19
2	PG	Issue P/O: <i>2005008</i> a) Extrude as per Dwg D6005 length = 180" (Ref. D6005-180) b) Material: 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11) ) Seamless aluminum tube c) Minimum ultimate tensile strength = 77ksi d) Minimum tensile yield strength = 66ksi e) <b>Material certification required</b>	<i>UC</i>	03.09.22	19
3	RG	Receive and inspect for transit damage <b>Ensure material certification attached</b>	<i>Q</i>	04.01.05	22
4	QC6	Inspect dimensions as per Dwg D6005 and check 180" length	<i>AB</i>	04.02.11	22 PTO
5	FP	Acid etch and alodine as per QSI 005 4.1 Inside and outside of tube	<i>2</i>	07.02.11	22
6	LG	Bend as per Dwg D2889 and Folio FT001 <b>Sign Page 2</b>			
7	QC6	Inspect dimensions per Dwg D2889 <b>Sign Page 2</b>			
8	LG	Deburr and Polish <b>Sign Page 2</b>			
9	FP	Acid etch and alodine as per QSI 005 4.1 Inside and outside of tube <b>Sign Page 2</b>			
10	QC5	Inspect work to Step 9 <b>Sign Page 2</b>			
11	ST	Identify and stock			
12	AC	Cost / part: <i>644.52</i>	<i>h</i>	05.04.27	10
13	DC	Close W/O <i>644.52</i> Inspect Level 21	<i>h</i>	05.04.29	10

N/A Now Added  
to 9 DIGIT

Rev	Date	Change	Revised By	Approved
A	99.05.31	New Issue, ECN 200	DM	
B	00.04.11	Remove Painting step	EC	
C	02.10.18	Re-format; Added spec	KJ <i>RF</i>	<i>QA</i>

RELEASED  
02/10/30 RF



Work Order:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Manuf / Design Mgr	Approval QC Inspector

NCR		WORK ORDER NON-CONFORMANCE					
DATE	STEP	Description of NC section A	Corrective Action Section B	Sign & Date	Verification Section C	Approval Design Mgr	Approval QC Inspector
04.02.11	41	Dimensions should be $\varnothing 2.750$ OD $\varnothing 2.000$ ID 0.375 Wall Actual dimensions are $\varnothing 2.741$ OD $\varnothing 2.000$ ID Wall Variance between 0.375" and 0.361"	acceptable OD only 0.003" out of tolerance used on Extended gear fuel tubes. - QC. (per D6005, OD is $\pm 0.006$ wall is $\pm 0.015$ )	[Signature] 04.02.11	[Signature] 04.02.11	[Signature] 04.02.11	[Signature] 04.02.11
	6	TUBE IS OVERSIZED	SCRAP	[Signature] 04.05.11	N/A	[Signature] 04.05.11	

PAR#: \_\_\_\_\_ Fault Category: \_\_\_\_\_ DQA: \_\_\_\_\_ Date: \_\_\_\_\_

 NOTE: Date & initial all entries  
 H:\Admin-QA\ISO\forms\w\oncb.doc

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

DART AEROSPACE LTD	Work Order:	19666
Description: Fwd Crosstube	Part Number:	D2889
Drawing: D2889 Rev. B; D6005 Rev. A	Qty:	19
		Page 2 of 2

W/O Step	A	B	C	D	E	F	G	H	I	J	K	L
6	11.5.11	OP 04/05/11	OP 04/05/11	DP 04/11/22	DP 04/11/22	DP 05-2-30	DP 05-3-3	DP 05/03/28				
7	11.5.11	OP 04/05/11	OP 04/05/11	OP 04/11/22	OP 04/11/22	OP 05-03-02	OP 05-03-03	OP 05-03-28				
8												
9												
10												

1 1

~~11.5.11~~

Save ED for D705-596-101  
 OP 04/11/22 SPAN is 119.125" angles 57°, 57°

RELEASED  
 02/10/30 RE

# Job Costing Report

Dart Aerospace Ltd.  
Hawkesbury

Sep 19, 2003  
01:10 pm

Work Order No : 0019666  
Project Name : D2889  
Project For : WK352  
Work Order Type : Main  
Main WO Number :  
House Part Number : D2889  
Description : FWD Crosstube  
Manufactured : Yes  
Amount Req'd : 19  
Amount Done : 0  
Start Date : 09-19-03  
Est Finish Date : 12-22-03  
Act Finish Date :  
Drawings Req'd : No  
Ok for Approval :  
Approval Rec'd :

Department Code:  
Burden Flags : NNNNNNN  
WO Status : Open  
Invoice State : Not Invoiced  
Invoice Date :  
Invoice Number :  
Invoice Amount : 0.00  
Order Entry No :  
OE Value : 0.00  
Est Margin : 0.000%  
Actual Margin : 0.000%  
\$0 Posted to Finished Goods

	Estimated	Actual	Var. %	Posted	To Post
Material Cost :	0.00	0.00	0.00	0.00	0.00
Engineering Hours :	0.00	0.00	0.00		
Engineering Cost :	0.00	0.00	0.00	0.00	0.00
Production Hours :	0.00	0.00	0.00		
Production Cost :	0.00	0.00	0.00	0.00	0.00
Testing Hours :	0.00	0.00	0.00		
Testing Cost :	0.00	0.00	0.00	0.00	0.00
OverHead Hours :	0.00	0.00	0.00		
OverHead Cost :	0.00	0.00	0.00	0.00	0.00
SubContract Hours :	0.00	0.00	0.00		
SubContract :	0.00	0.00	0.00	0.00	0.00
Misc. Hours :	0.00	0.00	0.00		
Misc. :	0.00	0.00	0.00	0.00	0.00
Burden :	0.00	0.00	0.00		
Total Cost :	0.00	0.00	0.00		
Margin :	0.000	0.000			
Selling Cost :	0.00	0.00			

	Estimated	Actual
Labour Hrs/Amount Done :	0.00	0.00
Profits/(Loss) :	0.00	0.00



## Abnahmeprüfbescheinigung 3.1 B - EN 10204

Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204

**Kunde:** Dart Aerospace Ltd.  
**Client:** 1270 Aberdeen Street  
 K6A1K7 Hawkesbury, ON Canada

**Zeugnisnummer:**  
 Cert No.: / No. du certificat: 2005668  
**Bestellnummer:** 2005668  
 Order No. / No. de commande  
**Auftrag:** 6438/1  
 Our Reference/Notre Reference:

**Produkt:** Tubes seamless extruded  
**Product / Produit:**  
**Spezifikation:** QQA 200/11e, Tol. Acc to ASTM B 210  
**Specification:**

**Werkstoff:** 7075  
**Alloy/Alliage:**

**Zustand:** T 6511  
**Temper/État**

**Abmessung:** 69,850 mm x 50,790 mm x 9,530 mm x 4572,00 mm  
**Size / Dimension:** Article D6005-180 2.750" x 0.375"

**Kennzeichnung:** Cert No.405/03-AWU-7075-T6511-Cast No.1049-QQA-200/11E-2.750"OD X0.375"Wall-Heat No.2974-Lot6438-1-1-  
**Marking/Marquage:** P.O.2005668

**Lieferung:** pcs. lbs  
**Delivered Material / Matériel délivré:** 22 1120

### 1. Chemische Analyse

### Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge/ min.			1,2		2,1	0,18	5,1						
Cast No. max.	0,40	0,50	2,0	0,30	2,9	0,28	6,1	0,20					
1049/03	0,124	0,239	1,361	0,057	2,372	0,192	5,683	0,037	0,004	0,0153	0,0001	0,0013	0,0030

**Hydrogen content:** 0,13 **ccm/100 g Al**

Elemente ohne Angabe < 0,01 % / Elements without indication < 0,01 %

### 2. Mechanische Eigenschaften

### Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) Ksi	yield (Rp0,2) Ksi	elongation 2" %	elongation A %	Hardness HB
min.	77,0	66,0			
max.					
1	84,825	78,155	9,0		146
2	86,275	80,040	8,0		157

**Ergebnis der Prüfungen:** Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

**Test results:** We confirm that the delivery has been tested and applies to the agreements made on receipt of the order  
**Resultats:** Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

Aluminiumwerk Unna AG · Uelzener Weg 36 · D-59425 Unna

Dart Aerospace Ltd.  
1270 Aberdeen Street  
CDN Hawkesbury, ONT, K6A1K7

Aluminiumwerk Unna AG

Uelzener Weg 36 · D-59425 Unna

Postfach 11 46 · D-59401

fon +49 (0) 23 03-206 - 0

fax +49 (0) 23 03-206- 116

info@alu-unna.de

www.alu-unna.de

page: 1  
date: 28.11.2003  
customer: 40980

## delivery note

## 7620

your PO dated: 22.09.2003  
your PO No.: 2005668  
AWU PO: 6438

contact: Petra Eisenblätter  
Tel.: + (303) 755 5672  
Fax: + (303) 755 5936  
representative: CLAUS J. BETTER

CARRIER: Senator

Your VAT No.:  
AWU VAT No.: DE177869055

We supply acc. to our delivery terms and conditions:

item	quantity	unit	net kgs
------	----------	------	---------

001	22,000	PC	
-----	--------	----	--

AWU article: 16538 / Customer article: D6005-180 2.750 x 0.375 x 180  
/Tariff no. 76082091

product: TUBES / seamless extruded / EN AW-7075 / round

condition: T 6511 / QQA 200/11E

outer diameter:	2,750 INCH Tol.	+0,012	-0,012
tol.for mean OD		+0,006	-0,006
inner diameter:	2,000 INCH		
wall thickness:	0,375 INCH Tol.	+0,037	-0,037
fixed length	180,000 INCH Tol.	+0,125	

test report acc. to EN 10204/3.1B / RM 531 / Rp0,2: 455

straightness 0,01 INCH / 1 FEET / RMS outer 25

tol. on quantity +10 % -10 %

2.750" OD 0.375" Wall, 180" lengths

Part Number D6005-180 crosstube

Surface Finish max. RMS 25

Tolerances per ASTM B210

Straightness 0.010" deviation /12" length

Outside surface: max. defects up to 0.005" (longitudinally)

Min. ultimate tensile strength 77 ksi



RECEIVED DLG 09 2003



ALUnna

Aluminiumwerk Unna AG · Uelzener Weg 36 · D-59425 Unna

Dart Aerospace Ltd.  
1270 Aberdeen Street  
CDN Hawkesbury, ONT, K6A1K7

Aluminiumwerk Unna AG

Uelzener Weg 36 · D-59425 Unna

Postfach 11 46 · D-59401

fon +49 (0) 23 03-206 - 0

fax +49 (0) 23 03-206- 116

info@alu-unna.de

www.alu-unna.de

page: 1  
date: 28.11.2003  
customer: 40980

# delivery note

7620

your PO dated: 22.09.2003  
your PO No.: 2005668  
AWU PO: 6438

contact: Petra Eisenblätter  
Tel.: +(303) 755 5672  
Fax: +(303) 755 5936  
representative: CLAUS J. BETTER

CARRIER: Senator

Your VAT No.:  
AWU VAT No.: DE177869055

We supply acc. to our delivery terms and conditions:

item	quantity	unit	net kgs
------	----------	------	---------

001	22,000	PC	
-----	--------	----	--

AWU article: 16538 / Customer article: D6005-180 2.750 x 0.375 x 180

/Tariff no. 76082091

product: TUBES / seamless extruded / EN AW-7075 / round

condition: T 6511 / QQA 200/11E

outer diameter:	2,750 INCH Tol.	+0,012	-0,012
-----------------	-----------------	--------	--------

tol. for mean OD		+0,006	-0,006
------------------	--	--------	--------

inner diameter:	2,000 INCH		
-----------------	------------	--	--

wall thickness:	0,375 INCH Tol.	+0,037	-0,037
-----------------	-----------------	--------	--------

fixed length	180,000 INCH Tol.	+0,125	
--------------	-------------------	--------	--

test report acc. to EN 10204/3.1B / RM 531 / Rp0,2: 455

straightness 0,01 INCH / 1 FEET / RMS outer 25

tol. on quantity +10 % -10 %

2.750" OD 0.375" Wall, 180" lengths

Part Number D6005-180 crosstube

Surface Finish max. RMS 25

Tolerances per ASTM B210

Straightness 0.010" deviation /12" length

Outside surface: max. defects up to 0.005" (longitudinally)

Min. ultimate tensile strength 77 ksi

Commerzbank AG, Unna

Konto-Nr. 102 56 00 · BLZ 443 400 37

S.W.I.F.T. - Code: COBADE FF 443

IBAN: 90 4434 0037 01025600 00





<b>DART AEROSPACE LTD</b>	Work Order:	19665
Description: Air Crosstube	Part Number:	D2890
Drawing: D2890 Rev. B; D6008 Rev. A	Qty:	2 <del>14</del>
		Page 1 of 2

Step	Location	Procedure	By	Date	Qty
1	DC	Issue Traveller <i>Dwg. not required RF 02.11.05</i>	<i>[Signature]</i>	03.09.19	14
2	PG	Issue P/O: <i>2005668</i> a) Extrude as per Dwg D6008 length = 180" (Ref. D6008-180) b) Material: 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11) ) Seamless aluminum tube c) Minimum ultimate tensile strength = 77ksi d) Minimum tensile yield strength = 66ksi e) <b>Material certification required</b>	<i>U</i>	03.09.22	14
3	RG	Receive and inspect for transit damage <b>Ensure material certification attached</b>	<i>[Signature]</i>	01.01.05	16
4	QC6	Inspect dimensions as per Dwg D6008 and check 180" length	<i>[Signature]</i>	01.01.13	16
5	FP	Acid etch and alodine as per QSI 005 4.1 Inside and outside of tube	<i>[Signature]</i>	04.01.13	16
6	LG	Bend as per Dwg D2890 and Folio FT002 <b>Sign Page 2</b>	<i>[Signature]</i>	09-11-26	2
7	QC6	Inspect dimensions per Dwg D2890 <b>Sign Page 2</b> <i>SEE PAGE 2 ✓</i>			
8	LG	Deburr and Polish <b>Sign Page 2</b> <i>✓</i>	<i>[Signature]</i>	04-11-26	2
9	FP	Acid etch and alodine as per QSI 005 4.1 Inside and outside of tube <b>Sign Page 2</b> <i>✓</i>	<i>[Signature]</i>	04-11-26	2
10	QC5	Inspect work to Step 9 <b>Sign Page 2</b>			
11	ST	Identify and stock	<i>[Signature]</i>	04-11-26	2
12	AC	Cost / part: <i>831.98</i>	<i>Suc</i>	05.01.31	2
13	DC	Close W/O <i>2231</i> Inspect Level 21	<i>[Signature]</i>	05.04.24	2

Rev	Date	Change	Revised By	Approved
A	99.05.31	New Issue, ECN 200	DM	
B	00.04.11	Remove painting step	EC	
C	02.10.18	Re-format; Added spec	KJ <i>RF</i>	<i>[Signature]</i>

Step 10 DS

RELEASED  
02/10/30 RF

<b>DART AEROSPACE LTD</b>	<b>Work Order:</b>	19665
<b>Description: Aft Crosstube</b>	<b>Part Number:</b>	D2890
<b>Drawing: D2890 Rev. B; D6008 Rev. A</b>	<b>Qty:</b>	14
		Page 2 of 2

W/O Step	A	B	C	D	E	F	G	H	I	J	K	L
6	Er 04-11-12	DP 04-11-18	<del>DP</del>									
7	Er 04-11-22	DP 04-11-18										
8	DP BE 04-11-18	DP BE 04-11-18										
9	DP pl 04-11-26	DP MA 04-11-26										
10												

RELEASED  
02/10/30 RF